Ex Vivo Transduction of the Human Artemis (DCLRE1C) cDNA by Lentiviral Vector AProArt into CD34+ Hematopoietic Cells for Artemis (ART)-Deficient Severe Combined Immunodeficiency (SCID)

Grant Award Details

Ex Vivo Transduction of the Human Artemis (DCLRE1C) cDNA by Lentiviral Vector AProArt into CD34+ Hematopoietic Cells for Artemis (ART)-Deficient Severe Combined Immunodeficiency (SCID)

Grant Type: Late Stage Preclinical Projects

Grant Number: CLIN1-08363

Project Objective: Complete pre-clinical studies and obtain IND.

Investigator:

Name:	Jennifer Puck
Institution:	University of California, San Francisco
Type:	PI

Disease Focus: Immune Disease, Severe Combined Immunodeficiency, Artermis deficient (ART-SCID), Blood Disorders

Human Stem Cell Use: Adult Stem Cell

Award Value: $4,268,865

Status: Active

Progress Reports

Reporting Period: Operational Milestone #1

View Report

Grant Application Details

Application Title: Ex Vivo Transduction of the Human Artemis (DCLRE1C) cDNA by Lentiviral Vector AProArt into CD34+ Hematopoietic Cells for Artemis (ART)-Deficient Severe Combined Immunodeficiency (SCID)

Public Abstract:

Therapeutic Candidate or Device

Blood-forming stem cells harboring a SCID gene defect, modified to become normal by addition of a correct copy of the Artemis/DCLRE1C DNA repair gene.

Indication

Treatment of severe combined immunodeficiency due to defects in the Artemis/DCLRE1C gene.

Therapeutic Mechanism

Severe combined immunodeficiency (SCID) is characterized by absence of T and B cell immunity. Infants with SCID die of infections unless rescued by functioning hematopoietic stem cells (HSC) that grow into T and B cells. Artemis-deficient SCID patients would be best treated by correcting their own HSC so as to avoid toxicity from radiation or chemotherapy generally needed for transplants from donors other than matched siblings. Optimal treatment corrects the patient's own HSC with a lentivirus.

Unmet Medical Need

Current standard bone marrow transplants for SCID require chemotherapy that is harmful to Artemis SCID patients and can lead to graft rejection and graft vs host disease. Patients are tolerant to their own blood-forming stem cells, so correcting and returning them will lead to a lasting cure.

Project Objective

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Major Proposed Activities

- Manufacture sufficient pre-clinical vector for toxicity and efficacy studies and clinical grade vector for clinical trial
- Complete non-clinical toxicity studies and demonstrate ability to manufacture transduced human cells at clinical scale
- Complete non-clinical efficacy studies

Statement of Benefit to California:

CA infants with SCID are now detected at birth by newborn screening, providing an opportunity to give immune system restoring treatment prior to onset of infections so that the infants are cured and grow up healthy. But optimal treatment for SCID caused by Artemis gene defects is elusive due to their innate sensititivity to chemotherapy used during transplants. This project will permit their safe, effective treatment. It will and make CA a world leader in gene therapy.

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